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PATENT SPECIFICATION

512458



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(Germany)

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COMPLETE SPECIFICATION

The Manufacture of Polymerisation Products of 2-chloro- or 2-bromo-butadiene-1.3

We, I. G. FARBENINDUSTRIE AKTIEN-GESELLSCHAFT, a joint stock company organised under the laws of Germany, of Frankfort-on-Main, Germany, do hereby
5 declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

10 The invention relates to the manufacture of polymerisation products of 2-chloro- or 2-bromobutadiene-1.3.

In accordance with the invention 2-chloro- or 2-bromobutadiene-1.3. is poly-
15 merised in aqueous emulsion in the presence of a dialkyl-xanthogen disulphide.

The dialkyl-xanthogen disulphides may be obtained by oxidising dialkyl xanthogenates with potassium bichromate.
20 In most cases an amount of less than 1% of these dialkyl-xanthogen disulphides (calculated on the amount of monomeric products) is sufficient to exert the desired effect; in other cases

25 somewhat higher amounts are required. Depending on the amount of the additions the resulting polymerisates either resemble natural rubber or are of a more plastic nature, the yield and solubility in

30 organic solvents such as benzene being excellent regardless of the amount of the dialkyl-xanthogen disulphides. In this respect the present process is superior to the hitherto employed heat polymerisation in the presence of sulphur and sulphur-containing compounds, since in the latter case the amount of regulators must be carefully controlled if a good
40 yield is to be combined with a good solubility of the polymerisates.

As a matter of fact, the 2-chloro- or 2-bromobutadiene-1.3. can be employed in combination with other polymerisable compounds such as styrene or acrylic acid
45 nitrile.

[Price 1/-]

Price 4s 6d.

Most of the polymerisates which are obtainable in accordance with the present invention can be employed as such for the preparation of vulcanised rubber. Those products which due to the applica-
50 tion of a large amount of the regulator are of a more plastic nature can be employed as softeners for natural or synthetic rubber. The incorporation of these softeners within the natural or
55 synthetic rubber may be effected in any desired stage prior to vulcanisation, for instance on the roller or by mixing both ingredients in an emulsified state or by mixing a solution of one of the ingredi-
60 ents with an emulsion of the other.

The following examples illustrate the production of polymerisation products in accordance with the invention, the parts being by weight:—
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EXAMPLE 1.

0.2 part of diisopropylxanthogen disulphide dissolved in
47.5 parts of 2-chlorobutadiene-1.3 and
2.5 parts of 1-phenoxypropene-oxide-
70 2.3 is poured into
50 parts of a 2% sodium oleate solution while thoroughly stirring and keeping at a temperature of 20—
30° C. In a nearly quantitative
75 yield a benzene soluble polymerisate is thus obtained.

EXAMPLE 2.

0.4 part of diethylxanthogen disulphide dissolved in
180 parts of 2-chlorobutadiene-1.3, 80
10 parts of acrylic acid nitrile and
10 parts of 1-phenoxypropene-oxide-
2.3 is poured into
200 parts of a 2% sodium oleate solu- 85
tion.

On working up a soluble polymerisate is

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obtained which can easily be rolled and which on vulcanising shows excellent mechanical properties.

EXAMPLE 3.

- 5 0.4 part of diisopropylxanthogen disulphide is dissolved in
 180 parts of 2-chlorobutadiene-1.3,
 10 parts of styrene and
 10 parts of 1-phenoxypropene-oxide-2.3:

10 thereupon this solution is emulsified in 200 parts of a 2% solution of diisobutyl-naphthalene sulphonate containing 8 parts of caustic soda lye. On polymerising at 20—30° C. a soluble product is obtained which can easily be worked up on the roller and which on vulcanising shows excellent mechanical properties.

15 Having now particularly described and 20 ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

- 25 1. The manufacture of polymerisation products by polymerising 2-chloro- or 2-bromobutadiene-1.3 in aqueous emulsion

in the presence of a dialkyl-xanthogen disulphide.

2. Process as claimed in claim 1 wherein diisobutyl-xanthogen disulphide 30 is employed as the dialkyl-xanthogen disulphide.

3. Process as claimed in claim 1 wherein mixtures of 2-chloro- or 2-bromobutadiene-1.3 with other polymerisable products 35 are employed as starting materials.

4. The process which comprises incorporating the polymerisates which are obtainable in accordance with any of claims 1 to 3 with a natural or synthetic rubber. 40

5. The manufacture of polymerisation products substantially as described in the examples.

6. Polymerisates whenever prepared or produced by a process claimed in any of the preceding claims or by any process 45 which is an obvious chemical equivalent thereof.

Dated this 3rd day of January, 1939.

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